## Municipal Health Officers' Section.

# PROTECTION OF PUBLIC MILK SUPPLIES FROM SPECIMENS CONTAMINATED WITH PUS ORGANISMS

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An important and frequently neglected factor in procuring a clean milk supply is the elimination of specimens contaminated with pus organisms. Although these samples, indicative of udder complications, cannot all be excluded, a persistent effort should be inaugurated in the attempt to reduce their number to a minimum. With milk supplies of large cities the only practical method for municipal health officers appears to be microscopic examinations of specimens, and where streptococci or excess of pus are indicated prohibiting the sale of milk from the faulty sources, until such time as the conditions become normal.

It is not the province of this paper to deal with the methods which are to be employed in determining the extent of infection by pyogenic organisms; but while good methods are essential, likewise correct interpretation of results, little progress can be made if too much time is devoted to the leucocyte pus controversy, or to the significance to be attached to the finding of streptococci, either in limited or large amounts. The practical and necessary problem is not argument, but

that of exclusion of milk from unhealthy animals. A system which has brought satisfactory results is that adopted in Boston in 1905. Beginning at that time, samples were collected almost daily, and subsequently examined at the Bacteriological Laboratory, under direction of Mr. B. R. Rickards. The findings, when completed, were reported to the Bureau of Milk Inspection, by which office the collections were also made. Samples containing streptococci and all those reported as contaminated with pus, namely, those having fifty or more pus cells to the one-twelfth immersion field, *i.e.*, about 500,000 pus cells to a cubic centimeter, were deemed actionable, and where the milk was from a definite source, future supplies from that quarter were excluded until the milk became normal. Where the objectionable sample was of mixed milk an effort was made to discover and eliminate the faulty dairy.

While this policy was at first viewed by dealers with disfavor, there is, at the present time, less opposition to the exclusion of infected milk than has been hitherto evidenced over this prohibitive mandate. That the above course has brought about a lessening in the number of these objectionable specimens can be demonstrated by the following figures:

| *Year* | *Number of Samples Examined* | *Per Cent of Infected Samples* |
|---|---|---|
| 1905 | 5.559 | 10.48 |
| 1906 | 5.007 | 4.90 |
| 1907 | 4.609 | 1.10 |

Since beginning the exclusion of infected milk the contracting or wholesale firms have established bacteriological laboratories for examining their own supplies. Their aid in the detection and debarment of abnormal specimens has been a potent factor in reducing the number of undesirable samples. In 1906, of 27,000 bacteriologic examinations made by these firms, 1,300, or 4.81 per cent, proved to be infected. During 1907 the same firms examined 29,208 samples, and 928, or 3.17 per cent, were classified as containing

pus or streptococci. When the milk was found to be at fault, prompt notice of this fact was sent to the producer, and the product of the animals in question, as soon as ascertained by subsequent examination of samples from individual cows, was excluded from the supply. This attitude on the part of wholesale firms is commendable, and no doubt has assisted materially in reducing the amount of objectionable milk.

The Bureau of Milk Inspection has not been content with excluding these abnormal milks, but in every instance an effort has been made to ascertain the condition of the cows at the dairies at fault. The data obtained in this search for information was procured, for the most part, through the assistance of the contractor. Experience has demonstrated, however, that it is impossible to obtain the facts in each instance without personal investigation, and for several reasons that course has been impossible. The list which appears below offers ample evidence, however, that much of the infected milk might have been excluded by dairymen who were both observant and considerate of the public welfare. In some instances negligence was apparent, but in other cases positive disregard of the consumers' interest was demonstrated.

The following is a summary of some of these investigations of dairies (referred to by numbers), the milk from which was contaminated with either streptococci, pus, or pus and streptococci. (In some instances the findings denote mixed infection.)

1. Two cows with pulmonary tuberculosis; both were subsequently killed. One cow about to drop calf.
2. One cow about to calve.
3. Two gargety cows; one chronic. One five-teated cow giving milk from only two teats.
4. Cows in poor physical condition; these were immediately sold.

5. Herd subjected to tuberculin test; the cows responding being sold.
6. Cow with hard udder.
7. Cow with lumpy udder, thought to be due to calf leaving cow when the latter was in full milk.
8. Cow with inflamed udder from having been hooked by another animal.
9. One tuberculous cow, which was killed. One cow with three teats. Subsequent to the exclusion of the milk from these cows, the contractor learned that the milkmen whom he supplied had persistently refused, on the physical test of taste and smell, to use this milk, but after its elimination the same dealers were buying the milk of this dairy with apparent satisfaction.
10. Two hind quarters of the udder of one cow badly congested; apparently had been in this condition for some time.
11. Two cows responded to tuberculin test; they were killed.
12. Trouble due to use of milk from a three-teated cow.
13. Two dairymen refused to have their stock examined by a veterinarian. Their milk was not afterward allowed to enter the city.
14. Farmer reports one cow in a bad physical condition.
15. Cow with a sore on one teat; producer claimed this milk was not being sent to this city. Two cows with congested udders.
16. Gargety cow. Another cow which had recently calved.
17. Dirty barn; cows caked with dried manure. One cow with a swollen udder. Producer had not complied with requests made at the last inspection by the contractor.
18. Two cows with inflamed udders, one giving bloody milk. Cows subjected to the tuberculin test and some which denoted a positive reaction killed.

19. Gargety cow.
20. One cow nearly dry; another fresh from calf.
21. Cow in poor physical condition.
22. "Rheumatic cow."
23. Gargety cow; general surroundings of this dairy such that none of the milk was allowed to come to this city.
24. Cow with a swollen udder.
25. Cow in poor physical condition since calving. The existing state of affairs, due to retention of afterbirth and the attendant discharge, some of which found its way into the milk pail, was disgusting and apparent to observation.
26. Gargety cow.
27. One cow with a high fever. One cow giving milk from one teat by means of a milk tube.
28. Cow recently calved; another cow about to calve.
29. Gargety cow with swollen udder.
30. Cow with a section of the udder atrophied and discharging pus.
31. Cow with a blind abscess.
32. Cow with one teat obstructed; milk contains much pus.
33. Cow with a large abscess on udder.
34. Cow had a sliver in one teat; milk from the other quarters was being sent to market.
35. Cow recently calved.
36. Two cows nearly dry.
37. Cow with one quarter of udder badly swollen. Producer claimed that this milk was not being used; undoubtedly some of it was in the mixed supply.
38. Cow fresh from calf.
39. Two gargety cows.
40. Drying off two cows.
41. Cow with several sores on teats.
42. Five cows being dried off.
43. Cow with one-quarter of bag caked and swollen.
44. Drying up three cows.

45. Cow with garget.
46. Cow recently calved.
47. Cow with sore teats; probably the stripping was not thorough.
48. Two cows approaching the calving period.
49. Cow with sore teat.
50. Sick cow. Farmer told the milk dealer he knew the milk was "not right."
51. Cow approaching the calving period.
52. Cow with garget; giving only two quarts of milk per day and soon to calve.
53. Gargety cow.
54. Cow injured some time ago, and giving milk from only three teats.
55. Cow nearing the calving period.
56. Cow in poor physical condition.
57. Cow with two hind quarters of udder congested.
58. Cow recently calved.
59. Producer kept out of market supply only four milkings after calving. At this farm there were nineteen cows fresh from calf, and the milk from these animals was being sent to Boston.
60. Three cows approaching the calving period.
61. Cow in heat.
62. One cow in poor condition; has a cough and is much emaciated; subsequently this cow was found to be tuberculous and was killed. The barn was dirty and poorly lighted.
63. Three cows recently calved.
64. Cow nearly dry.
65. Drying off three cows; they were being milked only once a day.
66. One cow had occasionally given bloody milk, and it was thought that some of this milk became mixed with the supply sent to market. By an examination of the remaining cows in this herd it was found that

two of the animals had swollen throat glands; another had a bunch upon the udder, and the respiration of four cows was abnormal. The product of five cows was ordered excluded from the milk sent to market.

67. One cow nearly dry. Other cows being fattened and giving only two to three quarts of milk daily.
68. Cow reported as gargety. It was subsequently ascertained that this cow was a poor milker, "not giving milk freely." To obviate the difficulty, a spring lance was inserted in the cow's teats. The lance was then opened and drawn through the teat for the purpose of removing any obstruction. After this operation blood flowed from the teats for several days. Later the milk was supplied to consumers, and an examination disclosed its abnormality.
69. Gargety cow.
70. Cow with inflamed udder.
71. Two cows nearly dry.
72. One cow with a swollen udder and with respiration slightly above normal.
73. One cow with a weak quarter; another cow was found to have a "fallen hip."
74. Gargety cow.
75. Cow with caked udder.
76. The milk from seven cows about to calve was being sent to market.
77. One cow with a "puff boil" and swollen udder.

In a more recent instance, where abundance of pus had been discovered in the milk from a dairy of one hundred cows, nearly thirty animals were found with indurated udders, and one cow had an abscess upon one teat from which a purulent and offensive discharge was obtained. It is true that in this instance the product from this quarter of the udder was not being sold; but as the trouble was not localized, the milk from the other quarters, which was being mixed

with the product from this dairy, was heavily charged with pus. After the discovery of the facts, and under orders from the authorities, the cow was removed from the herd, a step which should have been taken when her condition first became known to those in charge of the stable.

In other recent investigations following the discovery of abnormal milk, nine cows in a herd of forty were found to have garget; one cow in a herd of nine was affected with garget; and one cow in a herd of six had the same trouble. These occurrences may be further duplicated, and in instances where producers were well aware of the presence of diseased animals in their herds.

The following conclusions are offered:

1. Dairymen do not exercise sufficient care in observing the condition of their stock, and do not exclude from the milk offered to the public the product of unhealthy cows, and of cows just prior to or subsequent to the calving period.

2. Apparent abnormality in cows, such as certain forms of udder trouble, afford ample warning to observant dairymen that the milk is likely to be unwholesome, and that in all fairness to purchasers and consumers it should not be offered for sale. It is nothing short of criminal for producers to permit the milk from diseased animals to be used by the public. Both decency and law demand the fullest protection for consumers.

3. While present methods afford a means of detecting this objectionable milk, producers should not await the result of such examinations, but should take the initiative in withholding milk from all suspected animals.

4. It is to the advantage of the producer to render all possible assistance, even if it entails a temporary pecuniary loss from throwing away a small amount of milk. In the end it means a greater market for his product, for public confidence in a milk supply insures a demand for increased quantities of this fluid.

5. Until the producer is willing to give the consumer the protection which is his due, the method outlined in this paper affords an effective means for materially reducing the amount of abnormal milk.